

IN THE CLAIMS:

Amend claim 1, cancel claims 2-35 without prejudice or admission, and add new claims 36-48 as shown in the following listing of claims, which replaces all previous versions and listing of claims in this application.

1. (currently amended) A method of preparing a sample chip and observing ~~its~~ a wall surface thereof, comprising the steps of:

~~a first step including irradiating a sample with a focused ion beam, etching a surrounding area and a bottom portion of a predetermined area, and making the~~ of etching a preselected portion of a sample and an area surrounding the preselected portion of the sample by irradiating the sample with a focused ion beam to form a sample chip having a wall surface formed with stepped portions;

a second step of taking out the sample chip from the sample; and

a third step of observing a the wall surface of the ~~taken~~ sample chip with a scanning probe microscope ~~(SPM)~~.

2. - 35. (canceled).

36. (new) A method of preparing a sample chip and observing a wall surface thereof, comprising the steps of:

a first step of etching a preselected portion of a sample and an area surrounding the preselected portion of the sample by irradiating the sample with a first focused energy beam to form a sample chip;

a second step of picking-up the sample chip from the sample;

a third step of irradiating a wall surface of the sample chip with a second focused energy beam to thereby etch the wall surface; and

a fourth step of observing the etched wall surface of the sample chip using a scanning probe microscope.

37. (new) A method according to claim 36; wherein the second step further comprises the step of securing the sample chip to a sample chip holder after the sample chip is picked-up from the sample so that the wall surface of the sample chip etched in the third step and observed in the fourth step faces in an upward direction.

38. (new) A method of according to claim 36; wherein the first focused energy beam is a focused ion beam, and the second focused energy beam is an argon ion beam.

39. (new) A method of according to claim 38; wherein the first step includes the step of processing the sample chip to form stepped portions in the wall surface of the sample chip.

40. (new) A method of preparing a sample chip and observing a wall surface thereof, comprising the steps of:

a first step of etching a preselected portion of a sample and an area surrounding the preselected portion of the sample by irradiating the sample with a first focused energy beam to form a sample chip;

a second step of taking out the sample chip from the sample;

a third step of irradiating a wall surface of the sample chip with a second focused energy beam thereby to etch the wall surface;

a fourth step of observing the etched wall surface of the sample chip using a scanning probe microscope;

a fifth step of irradiating the observed wall surface of the sample chip with the first focused energy beam to thereby to etch the observed wall surface; and

a step of repeating the third to fifth steps a preselected number of times.

41. (new) A method according to claim 40; wherein the first focused energy beam is a focused ion beam, and the second focused energy beam is an argon ion beam.

42. (new) A method according to claim 41; wherein the first step and/or the fifth step includes the step of processing the sample chip to form stepped portions in the wall surface of the sample chip.

43. (new) A method of preparing a sample chip and observing a wall surface thereof, comprising the steps of:

a first step of etching a preselected portion of a sample and an area surrounding the preselected portion of the sample by irradiating the sample with a first focused energy beam to form a sample chip;

a second step of taking out the sample chip from the sample;

a third step of irradiating a wall surface of the sample chip with a second focused energy beam thereby to etch the wall surface;

a fourth step of observing the etched wall surface of the sample chip using a scanning probe microscope;

a fifth step of irradiating the observed wall surface of the sample chip with the first focused energy beam to thereby to etch the observed wall surface; and

a step of repeating the fourth and fifth steps a preselected number of times.

44. (new) A method according to claim 43; wherein the first focused energy beam is a focused ion beam, and the second focused energy beam is an argon ion beam.

45. (new) A method according to claim 44; wherein the first step includes the step of processing the sample chip to form stepped portions in the wall surface of the sample chip.

46. (new) A method according to claim 43; further comprising the step of forming the sample chip with a rectangular parallelepiped shape in an asymmetric form to facilitate identification of the wall surface of the sample chip in the fourth step.

47. (new) A method of preparing a sample chip and observing a wall surface thereof, comprising the steps of:
providing a sample having a multi-layered structure made of different materials;

irradiating the sample with a focused energy beam to form a sample chip while a wall surface of the sample chip is gas-assist-etched so that the wall surface is formed with stepped portions due to differences in the materials of the multi-layered structure of the sample;

taking out the sample chip from the sample; and
observing the wall surface of the sample chip having
the stepped portions with a scanning probe microscope.

48. (new) A method of according to claim 47;
wherein the focused energy beam is a focused ion beam.